DEPARTMENT of ENVIRONMENTAL SERVICES
Water Supply & Pollution Control Division - Biology Bureau

LAKE TROPHIC DATA

MORPHOMETRIC:

Lake:	HORSESHOE POND	Lake Area (ha):	15.01
Town:	MERRIMACK	Maximum depth (m):	7.0
County:	Hillsborough	Mean depth (m):	2.4
River Basin:	Merrimack	Volume (m^3):	359000
Latitude:	42°51'06" N	Relative depth:	1.6
Longitude:	71°29'22" W	Shore configuration:	2.11
Elevation (ft):	95	Areal water load (m/yr):	0.47
Shore length (m):	2900	Flushing rate (yr^{-1}):	0.20
Watershed area (ha):	18.7	P retention coeff.:	0.95
% watershed ponded:	0.0	Lake type:	natural

BIOLOGICAL:		9 February 1998	17 June 1997
DOM. PHYTOPLANKTON (% TOTAL)	#1	SPARSE - NO DOMINANT	CERATIUM 30%
	#2		OSCILLATORIA 25%
	#3		MALLOMONAS 20%
PHYTOPLANKTON ABUNDANCE (units/mL)			
CHLOROPHYLL-A (μg/L)			19.39
DOM. ZOOPLANKTON (% TOTAL)	#1	NAUPLIUS LARVA 42%	NAUPLIUS LARVA 24%
	#2	KELLICOTTIA 23%	CALANOID COPEPOD 15%
	#3		
ROTIFERS/LITER		63	43
MICROCRUSTACEA/LITER		69	111
ZOOPLANKTON ABUNDANCE (#/L)		132	170
VASCULAR PLANT ABUNDANCE			Common/Abun
SECCHI DISK TRANSPARENCY (m)			2.7
BOTTOM DISSOLVED OXYGEN (mg/L)		6.6	0.1
BACTERIA (E. coli, #/100 ml)	#1		3
	#2		23
	#3		

SUMMER THERMAL STRATIFICATION:

stratified

Depth of thermocline (m):	2.7
Hypolimnion volume (m^3) :	9500
Anoxic volume (m^3) :	20500

CHEMICAL:

Lake: HORSESHOE POND
Town: MERRIMACK

	9 February 1998		17 June 1997		
DEPTH (m)	1.0	3.0	1.0	4.0	6.0
pH (units)	6.0	6.4	7.0	6.2	6.2
A.N.C. (Alkalinity)	19.0	19.5	13.6	17.6	24.1
NITRATE NITROGEN	0.17	0.19	< 0.05		0.05
TOTAL KJELDAHL NITROGEN	0.50	0.60	0.30	0.70	1.70
TOTAL PHOSPHORUS	0.014	0.156	0.019	0.052	0.107
CONDUCTIVITY (µmhos/cm)	313.0	315.0	226.0	275.0	309.0
APPARENT COLOR (cpu)	16	16	23	49	> 150
MAGNESIUM			1.70		
CALCIUM			8.6		
SODIUM			32.8		
POTASSIUM			1.70		
CHLORIDE	81	81	54		74
SULFATE	10	10	8		7
TN : TP	48	5	16		16
CALCITE SATURATION INDEX			2.2		

All results in mg/L unless indicated otherwise

TROPHIC CLASSIFICATION: 1997

D.O.	S.D.	PLANT	CHL	TOTAL	CLASS
4	3	4	4	15	Eutro.

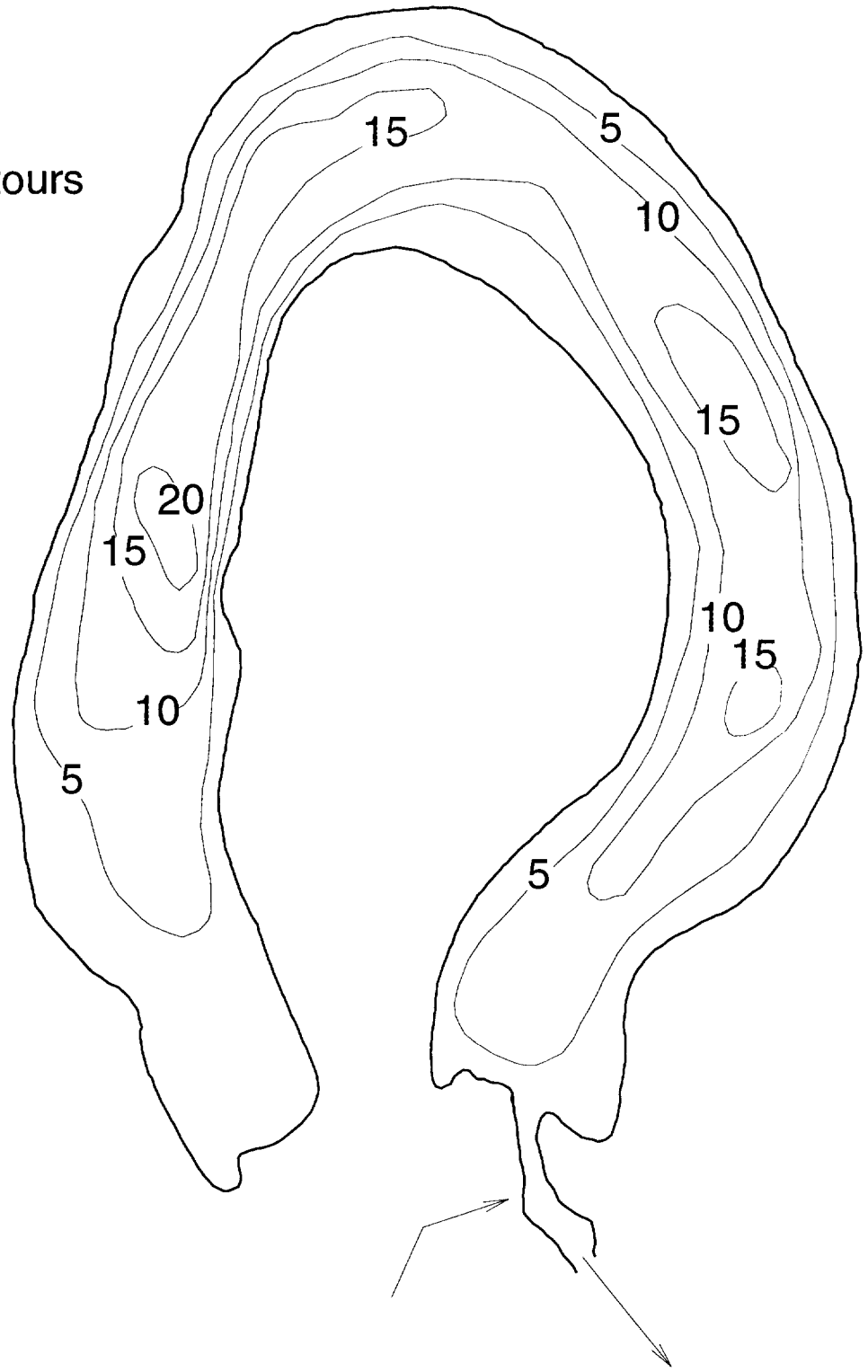
COMMENTS:

1. This pond was previously surveyed and classified in 1979. There was no change in the trophic classification and little change in water quality between the two dates.
2. This is an ox-bow pond located in the floodplain of the Merrimack River.
3. The watershed and related data (e.g., flushing rate) were calculated in two ways: including and not including Naticook Brook. The topographic map shows Naticook Brook entering the outlet stream of the pond rather than the pond itself, and thus the watershed area reported here does not include the Naticook Brook watershed (Note: The flushing rate would increase from 0.2 times per year to 12.1 times per year if the Naticook Brook watershed is included). Note: It is reported that Merrimack River water can flow back into the pond at high levels, further confounding the validity of the calculated flushing rate.
4. This is a eutrophic pond showing internal phosphorus release in both winter and summer. High conductivity, sodium and chloride levels suggest salt runoff into the pond.

Horseshoe Pond

Merrimack

5 foot depth contours



0 0.1

Km

FIELD DATA SHEET

LAKE: HORSESHOE POND TOWN: MERRIMACK
DATE: 06/17/97 WEATHER: CLOUDY & CALM; 80'S

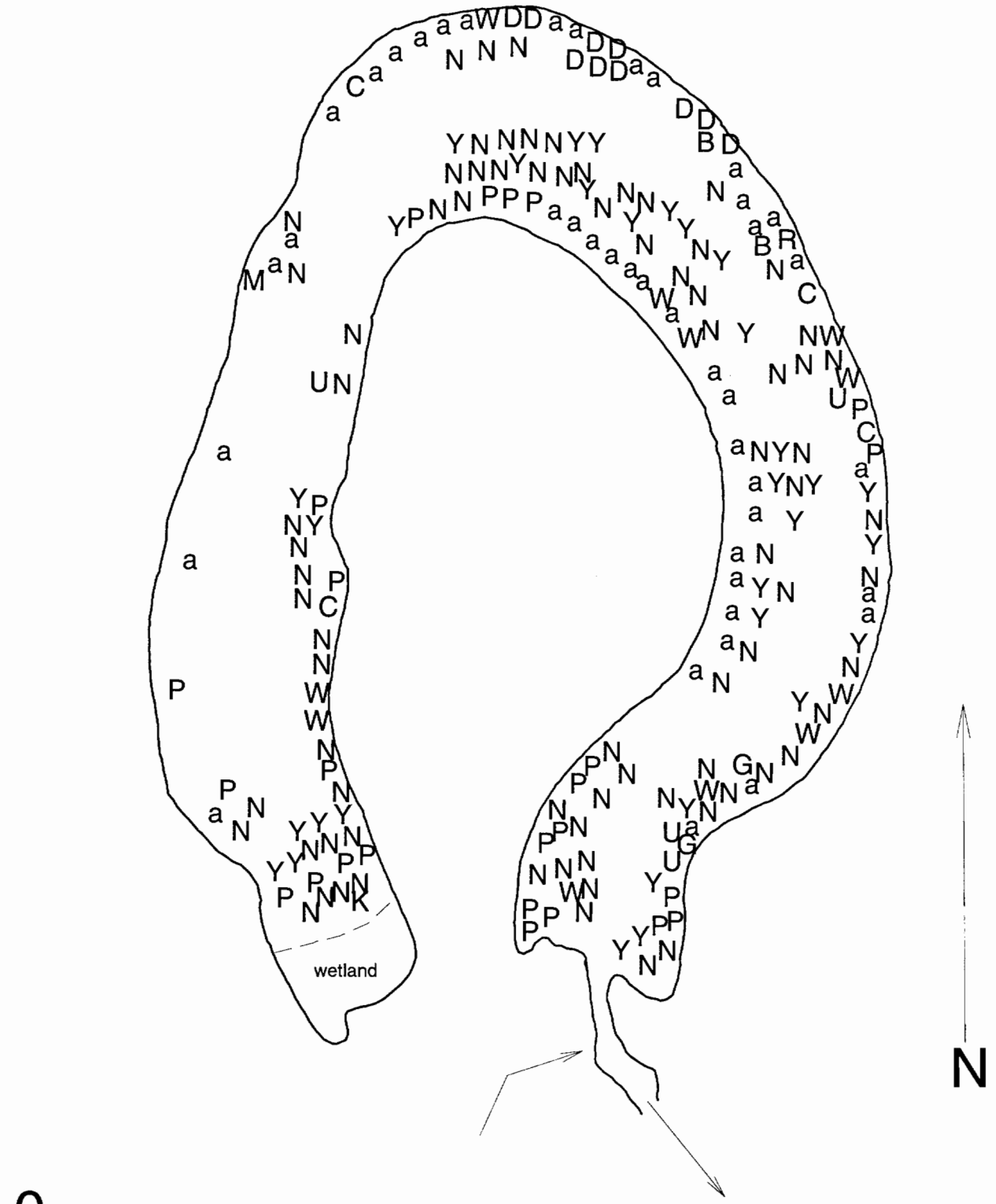
	DEPTH (M)	TEMP (°C)	*DISSOLVED OXYGEN	OXYGEN SATURATION
	0.1	22.5	9.2	105 %
	1.0	22.5	9.2	105 %
	2.0	21.5	9.1	102 %
	3.0	16.0	4.8	48 %
	4.0	12.0	1.0	9 %
	5.0	10.0	0.0	0 %
	6.0	9.0	0.1	1 %
	6.5	9.0	0.1	1 %

SECCHI DISK (m): 2.7 COMMENTS:
BOTTOM DEPTH (m): 6.8
TIME: 1230

*Dissolved oxygen values are in mg/L

Horseshoe Pond

Merrimack



AQUATIC PLANT SURVEY

LAKE: HORSESHOE POND TOWN: MERRIMACK DATE: 06/17/97

Key	PLANT NAME		ABUNDANCE
	GENERIC	COMMON	
N	Nymphaea	White water lily	Abundant
P	Pontederia cordata	Pickerelweed	Abundant
W	Potamogeton	Pondweed	Common
Y	Nuphar	Yellow water lily	Abundant
U	Utricularia	Bladderwort	Sparse
a	Peltandra virginica	Arrow arum	Common
G	Gramineae	Grass family	Sparse
D	Decodon verticillatus	Swamp loosestrife	Common
K		Unknown plant	Sparse
C	Ceratophyllum demersum	Coontail	Sparse
R		Sterile bottom rosette	Sparse
B	Brasenia schreberi	Water shield	Scattered
M	Myriophyllum humile	Water milfoil	Sparse

OVERALL ABUNDANCE: Common/Abun

GENERAL OBSERVATIONS:

1. Wetlands were present at the outlet and at the other end of the horseshoe.
2. The native species of milfoil were present.
3. The blue-green alga *Oscillatoria* was the second dominant net phytoplankton.